185. Presumably, if the regulation were deficient in either respect (a tall order under minimum rationality), then the regulation would not be a valid exercise of the police power, and compensation would be due the property owner. At the same time, of course, the regulation in question would be invalid on due process grounds. If, as is more likely, the regulation survived review under that minimum rationality standard, the takings analysis would proceed to consideration of *Penn Central*'s other two criteria.

b. The Economic Impact of the Regulation on the Claimant

186. This second criterion of *Penn Central* can be seen as a requirement to minimize the transactions costs of takings claims, along the lines of Justice Holmes' remark in *Pennsylvania Coal* that government "hardly could go on" if made to compensate every diminution in value arising from its regulation.[116] In *Loveladies* Judge Plager imputed just such a meaning to Justice Holmes' remark.[117] Below a certain cutoff, it would seem, an uncompensated diminution in property value arising from a change in regulation should not consume the resources of the state (as defendant) and the courts. That reasoning is analogous to the requirement that a party plead a minimum amount in controversy to establish jurisdiction.

187. Interestingly, Judge Plager reasoned in *Loveladies* that *Penn Central*'s overriding requirement—that the payment of compensation for a regulatory taking was conditioned on the property owner's showing that the government had denied him "economically viable use" of his property—was just another way of expressing the idea embodied in *Penn Central*'s second criterion concerning the economic impact of the regulation on the claimant.[118] In Judge Plager's words, both articulations expressed the same "threshold requirement that the plaintiff show a serious financial loss from the regulatory imposition."[119]

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116. 260 U.S. at 413.
117. 28 F.3d at 1176–77.
118. *Id.* at 1177 (citing Agins v. Tiburon, 447 U.S. 255, 260 (1980); *Nollan*, 483 U.S. at 834).
119. *Id.*

c. Interference with Distinct Investment-Backed Expectations

188. The remaining criterion in the *Penn Central* test—interference with distinct investment-backed expectations—does all the heavy lifting in a regulatory takings case. If the government has used its police power in a reasonable manner for a legitimate purpose, and if the regulation has diminished the value of private property by a nontrivial amount, then the remaining question is whether the property owner himself has absorbed that diminution or whether he already contracted to accept the diminution if and when it occurred. Again, Judge Plager's formulation in *Loveladies* is particularly lucid.

189. The requirement that the property owner establish his distinct investment-backed expectations is "a way of limiting takings recoveries to owners who could demonstrate that they bought their property in reliance on a state of affairs that did not include the challenged regulatory regime."[120] Judge Plager elaborated: "In legal terms, the owner who bought with knowledge of the restraint could be said to have no reliance interest, or to have assumed the risk of any economic loss. In economic terms, it could be said that the market had already discounted for the restraint, so that a purchaser could not show a loss in his investment attributable to it."[121]

190. To that analysis of risk bearing, one can add a related point: The requirement is a means to impose a system of falsifiability on what could otherwise become an inherently subjective inquiry. Without the requirement that the property owner objectively prove, through evidence of investment, that he detrimentally relied on the challenged regulatory regime, how could a court really know whether the regulation at issue had diminished *this person's* wealth at all? Specious claims of lost property value would otherwise inundate the state. That further explanation comports with the Court's observation in *Ruckelshaus* v. *Monsanto Co.* that "[a] 'reasonable investment backed expectation' must be more than 'a unilateral expectation or an abstract need,'"[122] and its statement in *Usery* v. *Turner Elkhorn Mining*

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120. *Id.*

121. *Id.*

122. 467 U.S. 986, 1005–06 (1984) (quoting Webb's Fabulous Pharmacies v. Beckwith, 449 U.S. 155, 161 (1980)), *quoted in Loveladies*, 28 F.3d at 1177.

Co. that "legislation readjusting rights and burdens is not unlawful solely because it upsets otherwise settled expectations."[123] A private party may have expectations that are, objectively speaking, unreasonable. The Court, not surprisingly, has delivered more guidance on what are *not* reasonable investment-backed expectations than what are.[124]

2. The Incumbent Utility's Investment-Backed Expectations

191. If analyzed as a regulatory taking, the problem of stranded costs is far more compelling than the typical case of land-use restrictions. The regulatory contract is a detailed contract that imposes obligations on the utility, its customers, and the regulatory authority. Moreover, the regulatory contract is subject to executive, legislative, and judicial oversight. The formality and continuity of the contract and its oversight reinforce the conclusion that it is reasonable for a utility to expect that the regulator will discharge its duties under the contract and that the contract is an agreement that may be enforced against the regulator in court.

192. Furthermore, the overriding purpose of the regulatory contract is to induce the utility to make specialized investments. By accepting its franchise, the regulated utility undertakes an obligation to serve—that is, to provide service to any and all customers in its service territory. The utility further agrees to abide by a host of regulations that determine its prices, product offerings, investments, and accounting procedures. Most important, the utility must make long-term investments in highly specialized, immovable facilities. The regulatory contract exists to create the institutional structure of incentives and credible assurances for the utility to undertake the substantial capital costs required to perform its service obligations. Without those credible assurances, a utility would not have been willing to incur capital costs to build the facilities needed to satisfy regulatory obligations to serve—including notably the provision of universal service at a uniform price, regardless of incremental cost.

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123. 428 U.S. 1, 16 (1976).

124. Concrete Pipe & Prods. of Cal., Inc. v. Construction Laborers Pension Trust for S. Cal., 113 S. Ct. 2264, 2291-92 (1993); Connolly v. Pension Benefit Guaranty Corp., 475 U.S. 211, 226-27 (1986).

B. Physical Invasion of Property and Its Relation to Mandatory Access to the Utility's Premises, Rights of Way, and Network Facilities

193. In contrast to regulatory takings, government policies that effect physical invasions of property elicit the greatest judicial protection of private property. A physical invasion of property compelled by the state gives rise to an absolute right of compensation.

1. The *Loretto* Decision

194. The leading decision on takings arising from physical invasion of property is the Supreme Court's 1982 decision in *Loretto* v. *Teleprompter Manhattan CATV Corp.*, which defended that rule even in the case of "a minor but permanent physical occupation of an owner's property authorized by government."[125] The Court announced that "when the 'character of the governmental action,' is a permanent physical occupation of property, our cases uniformly have found a taking to the extent of the occupation, without regard to whether the action achieves an important public benefit or has only minimal economic impact on the owner."[126]

195. At issue in *Loretto* was a New York statute that required a landlord to permit a cable television (CATV) company to install its CATV facilities upon her property, subject to payment of no greater than "reasonable" compensation set by a state commission. Exclusively franchised to build the CATV system within certain parts of Manhattan, Teleprompter wired Ms. Loretto's five-story apartment building, for which the commission deemed her to be entitled to a one-time payment of one dollar. The motivation for the statute is clear: Before enactment of the statute, Teleprompter routinely paid a property owner 5 percent of the gross revenues received from having access to his property.[127] The statute gave Teleprompter a way to pay a lower price for such access.

196. Teleprompter's physical invasion of Ms. Loretto's building was minor and consisted of a cable "slightly less than one-half inch in diameter and of approximately 30 feet in length along . . . the

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125. 458 U.S. 419, 421 (1982).
126. *Id.* at 434-35 (quoting *Penn Central*, 438 U.S. at 124) (citation omitted).
127. *Id.* at 423.

roof top," two directional taps on the front and rear of the roof that were four-inch cubes, "two large silver boxes along the roof cables," and the screws, nails, and bolts used to attach those various pieces of infrastructure to the building.[128] (Actually, two buildings were involved, but we have simplified the facts here.) Plainly, what motivated Ms. Loretto was not the obtrusiveness of Teleprompter's physical occupation of her property, but rather her opportunity cost (in terms of forgoing a 5 percent share of CATV subscription revenues generated by her tenants) upon being compelled to grant access to her property essentially for free.

197. Although *Loretto* was in practical terms a simple case of access pricing, the Court chose to make the fact of physical invasion dispositive.[129] Referring to one of *Penn Central*'s three criteria, Justice Marshall wrote for the majority that "when the physical intrusion reaches the extreme form of a permanent physical occupation, . . . 'the character of the government action' not only is an important factor in resolving whether the action works a taking but also is determinative."[130] A physical intrusion by government has "unusually serious character" and, if permanent, is "extreme" and fundamentally different from a temporary physical intrusion.[131] "When faced with a constitutional challenge to a permanent physical occupation of real property, this Court has invariably found a taking."[132] Professor Frank Michelman of Harvard Law School, the Court concluded, "accurately summarized" the law on physical invasions of property in his classic article:

> The modern significance of physical occupation is that courts . . . *never* deny compensation for a physical takeover. The one incontestable case for compensation (short of formal expropriation) seems to occur when the government deliberately brings it about that its agents, or the public at large, 'regularly' use, or 'permanently' occupy, space or a thing which theretofore was understood to be under private ownership.[133]

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128. *Id.* at 422.

129. *Id.* at 426 ("a permanent physical occupation authorized by government is a taking without regard to the public interests that it may serve").

130. *Id.*

131. *Id.*

132. *Id.* at 427-28.

133. *Id.* at 427 n.5 (quoting Frank Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165, 1184 (1967) (emphasis in original)).

Unlike the balancing analysis in a regulatory takings case, "a permanent physical occupation is a government action of such a unique character that it is a taking without regard to other factors that a court might ordinarily examine."[134] The Court likened its rule on permanent physical invasion to a per se rule in antitrust law.[135]

198. Under *Loretto*, the physical magnitude of the invasion of property does not matter. The Court said that "constitutional protection for the rights of private property cannot be made to depend on the size of the area permanently occupied."[136] The Court made light of the factual disagreement between the majority and the dissenters over the volume of the cable boxes attached to Ms. Loretto's building. "The displaced volume . . . . [is] not critical: whether the installation is a taking does not depend on whether the volume of space it occupies is bigger than a breadbox."[137]

199. Writing for the majority, Justice Marshall reasoned that a government policy permitting the permanent physical occupation of private property without compensation would be harmful to society as a matter of first principles, and that such considerations animated the precedents upon which the Court relied in *Loretto*. "Property rights in a physical thing," he reasoned, are "the rights 'to possess, use and dispose of it,'" and the government's permanent physical occupation of private property "destroys each of these rights."[138] Justice Marshall noted in particular that "the owner has no right to possess the occupied space himself, and also has no power to exclude the occupier from possession and use of the space. The power to exclude has traditionally been considered one of the most treasured strands in an owner's bundle of property rights."[139] A powerful economic rationale supports that conclusion, for the power to exclude is a prerequisite to voluntary exchange, allocative efficiency, and investment. The Court further noted that "the permanent physical occupation of property forever denies the owner any power

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134. *Id.* at 432.
135. *Id.* at 436.
136. *Id.* at 436 n.12.
137. *Id.* at 438.
138. *Id.* at 435 (quoting United States v. General Motors Corp., 323 U.S. 373, 378 (1945)).
139. *Id.* at 435-36 (citing *Kaiser Aetna*, 444 U.S. at 179-80; RESTATEMENT OF PROPERTY § 7 (1936)).

to control the use of the property; he not only cannot exclude others, but can make no nonpossessory use of the property. Although deprivation of the right to use and obtain a profit from property is not, in every case, independently sufficient to establish a taking, it is clearly relevant."[140] The Court emphasized that "an owner suffers a special kind of injury when a stranger directly invades and occupies the owner's property."[141]

200. Five years after *Loretto*, the Court considered a similar case. The Pole Attachments Act authorized the FCC to regulate the rates, terms, and conditions of the attachment of cable television wires to utility poles if the state did not engage in such regulation, but the statute (at that time) did not mandate access.[142] An electric utility challenged the statute as a permanent physical invasion of private property, but the Court ruled in *FCC* v. *Florida Power Corp.* that *Loretto* did not apply.[143] Justice Marshall, again writing for the majority, reasoned that the statute merely regulated prices in consensual transactions. Unlike the New York statute in *Loretto*, which contained the "element of required acquiescence . . . at the heart of the concept of occupation," the federal law did not compel the property owner to submit to an involuntary transaction.[144] In 1992 the Court reinforced that rationale: Property owners who "voluntarily open their property to occupation by others . . . cannot assert a per se right to compensation based on their inability to exclude particular individuals."[145] These subsequent decisions do not make *Loretto* any less applicable to mandatory network unbundling, for such regulatory actions are by definition not voluntary. Mandatory unbundling, unaccompanied by the simultaneous lifting of incumbent burdens and imposition of a mechanism to recover embedded costs, would constitute a taking under *Loretto*. Incumbent LECs have rights of way, poles, conduits, transmission lines, and the like. Indeed, to build that physical infrastructure, an incumbent LEC originally had to acquire the consent of the land owner

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140. *Id.* at 436 (citing Andrus v. Allard, 444 U.S. at 66) (citation omitted).
141. *Id.*
142. Pub. L. No. 95-234, § 6, 92 Stat. 35 (1978) (codified at 47 U.S.C. § 224).
143. 480 U.S. 245 (1987).
144. *Id.* at 252.
145. Yee v. Escondido, 503 U.S. 519, 531 (1992).

or, if it was exercising the right of eminent domain, pay just compensation for its taking.[146]

2. Mandatory Interconnection or Unbundling

201. Because of the technological and economic complexity of interconnection and unbundling in the telecommunications industry, it is easy to overlook the obvious: Mandatory interconnection and unbundling constitute a government-ordered, physical invasion of the property of the incumbent utility. Mandatory interconnection or unbundling envisions rivals of the regulated firm having physical access to its property. The Oregon Supreme Court has recognized that fact and, relying upon *Loretto*, held unanimously in 1995 that the state PUC's order that enhanced service providers be allowed to co-locate their equipment on the premises of incumbent local exchange carriers constituted a physical invasion that violated the Takings Clause.[147] The court emphasized that "the facts that an industry is heavily regulated, and that a property owner acquired the property knowing that it is heavily regulated, do not diminish a physical invasion to something less than a taking."[148]

202. It is possible for a physical invasion of the incumbent utility's property to occur even when the physical occupation is not visible. The first questions of interconnection pricing in modern regulatory experience arose in connection with the sale of "trackage rights" in the railroad industry. By order of the Interstate Commerce Commission, railroad *A* would be allowed to purchase the right to move its trains over tracks owned by railroad *B*, thus extending the geographic reach of railroad *A*'s rail network beyond its own facilities.[149] One can scarcely imagine a more vivid example of physical invasion than freight trains barreling down a stretch of track. In telephony networks, the locomotives are electrons and photons. Like the locomotive operating pursuant to trackage rights, a rival's use of the incumbent LEC's network involves occupying the physical capacity of that infrastructure to deliver a

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146. *See Loretto*, 458 U.S. at 429, 437.

147. GTE Northwest, Inc. v. Public Util. Comm'n of Ore., 321 Ore. 458, 468-77, 900 P.2d 495, 501-06 (1995), *cert. denied*, 116 S. Ct. 1541 (1996).

148. 321 Ore. at 474, 900 P.2d at 504.

149. *See* BAUMOL & SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY, *supra* note 89, at 95-96.

service that competes with the incumbent's.

203. Finally, it does not matter that the party making the physical invasion of the utility's network is a private company rather than the state itself. As the Court said in *Loretto*: "A permanent physical occupation authorized by state law is a taking without regard to whether the State, or instead a party authorized by the State, is the occupant."[150]

3. The Physical Occupancy of Telecommunications Networks

204. Traditional telecommunication networks consist of three primary components: transmitter, channel, and receiver. The transmitter inputs information and converts it into electromagnetic signals appropriate for transmission.[151] The channel, serving as the bridge between the transmitter and receiver, provides a transmission path for the signal.[152] That signal is a time-dependent value attached to an electromagnetic pulse that carries information.[153] During transmission, the electromagnetic signal may experience distortion and the addition of noise. Upon detection, the receiver extracts the weakened and distorted signal from the channel and amplifies it.[154] Ideally, the regenerated signal remains nearly identical to the original version.

205. In local telephony, the station terminal equipment, in the form of telephone sets, represents the transmitter and receiver.[155] The channel for local communication consists of customer loops, cable pairs that connect the station terminal equipment to a central office, and transmission paths established within a switching system.[156] The switching systems serve to connect a specific terminal of several thousand terminals to the transmitting channel.[157]

206. The initial stage of voice communication begins at the transmitter station terminal. The

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150. 458 U.S. at 432 n.9.

151. CLIFFORD R. POLLOCK, THE FUNDAMENTALS OF OPTOELECTRONICS 4-7 (Richard D. Irwin Inc. 1995).

152. *Id.* at 5.

153. JOSEPH A. PECAR, ROGER J. O'CONNOR & DAVID A. GARBIN, MCGRAW-HILL TELECOMMUNICATIONS FACTBOOK 17 (McGraw-Hill Inc. 1993).

154. POLLACK, *supra* note 151, at 5.

155. 1 BELL COMMUNICATIONS RESEARCH, TELECOMMUNICATIONS TRANSMISSION ENGINEERING: PRINCIPLES 8 (Bellcore 1990).

156. *Id.*

157. *Id.* at 11.

microphone in the telephone receiver, the transducer, absorbs sound waves and converts the differences in acoustic pressure into a continuously varying analog electromagnetic signal.[158] The analog signal is partitioned into a train of electrical impulses.[159] Each individual electric energy impulse, commonly called a bit, is characterized by a specific frequency and a specific amplitude corresponding to the unique pitch and unique loudness, respectively, of each sound.[160] The transformation of speech into electricity changes the character of sound from a continuous wave to a discrete number of individual bits. That transformation is accomplished through an analog-to-digital (A/D) converter built into the system.[161]

207. After discretization, electrical impulses are transmitted along the communication channel medium.[162] Bandwidth—that is, the range of allowed frequencies between the lower and upper limiting frequencies that varies with the transmission medium—determines the quantity of information the channel can transmit.[163] Ideally, the bandwidth is as large as possible to allow for greater information transmission capacity, which is defined as the number of bits per second that the channel can support.[164] In most telephone networks, bandwidth is set around 3,000 Hz (3 Khz) because the span of 300 Hz to 3 Khz is all that is required to carry voice information.[165]

208. Upon reaching the desired destination, the train of electric impulses is reconstructed into sound.[166] The original analog signal can be reconstructed according to the sampling theorem, provided that the sample frequency is at least twice the bandwidth, by generating a periodic impulse train in which

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158. PECAR, O'CONNOR & GARBIN, *supra* note 153, at 17.

159. For a graphical interpretation, see ALAN V. OPPENHEIM, ALAN S. WILLSKY & IAN T. YOUNG, SIGNALS AND SYSTEMS 515-16 (Prentice-Hall Inc. 1983).

160. PECAR, O'CONNOR & GARBIN, *supra* note 153, at 17.

161. For a rigorous description of A/D converters, see JACOB MILLMAN & ARVIN GARBEL, MICROELECTRONICS 719-24 (McGraw-Hill Inc. 2d ed. 1987).

162. *Id.* at 6. The medium for transmitting information is generally copper wire cable or fiber-optic cable. The physical properties of copper wire cable are similar to the transmission lines used for power delivery. For a discussion of the physics of fiber-optic cable, see POLLOCK, *supra* note 151.

163. WILLIAM L. SCHWEBER, ELECTRONIC COMMUNICATION SYSTEMS: A COMPLETE COURSE 14-15 (Prentice-Hall Inc. 1991).

164. PECAR, O'CONNOR & GARBIN, *supra* note 153, at 22-24.

165. *Id.* at 14.

166. The Shannon-Nyquist Sampling Theorem provides the scientific guidelines for recreating continuous sound from instantaneous discrete impulses. OPPENHEIM, WILLSKY & YOUNG, *supra* note 159, at 514-21.

the successive impulses have amplitudes that are successive sample values.[167] The sampling frequency must be high enough that the individually sampled pulses do not overlap; if overlap occurs, the original sound cannot be replicated.[168] The sampled signal is processed through a lowpass filter, a mechanism for removing low frequency noise and distortion, defined by a constant amplification factor and a cutoff frequency that is greater than the bandwidth and less than the difference between the sampling frequency and the bandwidth.[169] The filtered signal is converted back to an analog sound wave using a digital-to-analog (D/A) converter.[170] The output from the D/A converter should provide a continuous sound wave that is faithful to the unique characteristics of the original transmitted speech.

209. Unlike electric power transmission, electric impulse trains carrying information must follow predestined routes along the transmission channel. Whereas electric power is indistinguishable within a delivery network, each bit of information representing sound has a unique signature defined by its amplitude and frequency. Consequently, in a market where competitive local telephony takes place over a single network, if a customer chooses to be serviced by a competitor, then the incumbent utility must surrender all use of its transmission channels that connect to that customer. In the traditional telecommunications network built for voice communications, use of the transmission path is mutually exclusive because of the need for a dedicated line to carry voice traffic.[171] The capacity of the telephone network in terms of the number of message-minutes depends on the total number of available circuits.[172] This relationship means that the configuration of a telecommunication network's lines and switches inevitably places limits on the total number of telephone calls that can be simultaneously completed on the local exchange network.

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167. *Id.* at 519.

168. *Id.* at 527-31.

169. *Id.*

170. *See* MILLMAN & GARBEL, *supra* note 161, at 715-19.

171. This differs from data networks allow data transmissions to be broken down into individual packets that are addressed and then routed over a common transmission line. It is possible to integrate data transmission within the existing telecommunications network through the addition of software and switching equipment.

172. There are other measures of capacity such as the bandwidth of individual transmission lines.

210. Access refers to the use of the local exchange network for origination and termination of telephone traffic. Because there are capacity limitations on the total number of telephone calls that can be carried on the network, it is necessary to price that scarce capacity to allocate access to the network efficiently. If the price of access is too low, there will be excess demand for access, which will lead to network congestion. An important consequence of such congestion is a delay for users of the network in obtaining a dial tone or completing a call. Such delays are analogous to a traffic jam. A delay in service is a rationing device that is, under general conditions, an inefficient means of allocating scarce capacity in comparison to the correct pricing of access. The price of access plays an important economic role in allocating access across users of the telecommunications network.[173]

C. Uncompensatory Regulation of Public Utility Rates

211. Sandwiched between the strict protection of private property in cases of physical invasions and the minimal protection in cases of regulatory takings are the cases involving the setting of rates for regulated public utilities. Just as property rights are an essential element of private exchange, so also are they required for individuals to transact with the government. Constitutional protections of property rights and due process are the foundation for the administrative process of regulation.

212. Private property protection is the basis for utility regulation. The regulatory contract is subject to the full property protections of the Takings Clause.[174] As explained earlier, an investor-owned utility has a public mandate or obligation to provide service to all in a community who desire such

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173. The answer to this problem of congestion is not simply for the incumbent LEC to build more capacity, just as Judge Posner has observed that the answer to the problem of alleviating congestion in the federal courts is not simply to add more judges:

> The analogy is to the construction of a new freeway to relieve traffic congestion. The new freeway may induce people who formerly used other methods of transportation because of the cost of congestion to substitute driving, until the freeway is almost as congested as the roads it replaced. In both examples, by increasing supply in a way that reduces the quality-adjusted price, the government simultaneously increases the quantity demanded.

RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 579 (Little, Brown & Co. 4th ed. 1992).

174. Chang v. United States, 859 F.2d 893, 894 (Fed. Cir. 1988) ("There is no question that 'valid contracts are property, whether the obligor be a private individual, . . . or the United States.'") (quoting Lynch v. United States, 292 U.S. 571, 579 (1934)).

service. In fulfillment of that duty, and in reasonable anticipation of future requests for increased service, the utility purchases and employs specialized assets. Without adequate compensation, the utility will not seek to make investments for expansion or replacement of plant and property and will not be able to raise the necessary capital. Rate regulation controls the returns to investment by the utility's owners; such regulation affects the property's value and therefore must not be confiscatory.[175] The rate of return allowed on property used for public purposes must be sufficient to compensate investors.[176] Sufficiency is measured relative to rates that enable the regulated utility "to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risk assumed."[177] Furthermore, the establishment of formal regulatory proceedings with hearings on the record by administrative regulatory agencies reflects the constitutional guaranty that the utility receive due process in ratemaking.

1. The *Duquesne* Test of Fair Return on Prudently Incurred Investment

213. A taking occurs if regulatory authorities interfere with the utility's opportunity to earn a fair return on prudently incurred investment to carry out regulatory obligations. Because the state regulates the return that the utility can earn, courts have long considered rate regulation of a utility's property to be subject to the Takings Clause. Uncompensatory rate regulation thus requires compensation of the utility's investors for their forgone expected returns. The major takings cases involving regulated utilities, such as *Hope* and *Duquesne*, do not clearly answer the question of whether the regulator's refusal to allow the utility the opportunity to recover stranded costs is a taking, for those decisions did not address the consequences of deregulation and wholesale abrogation of the regulatory contract in the name of establishing a competitive marketplace.

214. In *Duquesne*, the Duquesne Light Co. began making investments in new nuclear power plants. (Several other utilities were involved in *Duquesne*, but for simplicity I refer only to Duquesne.)

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175. Covington & Lexington Turnpike Road Co. v. Sandford, 164 U.S. 578, 597 (1896) ("a rate that is too low can 'destroy the value of [the] property.'").

176. Duquesne Light Co. v. Barasch, 488 U.S. 299, 308 (1989); Smyth v. Ames, 169 U.S. 466, 546 (1898).

177. Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 605 (1944).

Those investments were reasonable (prudent) in light of the current costs of different production technologies and expected future demand at the time they were made. Changes in the relative costs and risks of nuclear power (for example, the Three Mile Island nuclear mishap) resulted in a further (prudent) decision to abandon the nuclear power plants. Duquesne had spent roughly $35 million in planning and preparation by that time.[178] Duquesne sought to add those sunk costs to its rate base and to recover them through amortization and the allowed rate of return. Unfortunately for Duquesne, however, Pennsylvania enacted legislation after the expenditure but before the inclusion of the nuclear costs in the rate base that foreclosed the Pennsylvania Public Utility Commission from granting Duquesne recovery of those costs though higher utility rates.[179] The Court examined whether the state legislation caused a taking of the property of Duquesne's shareholders without just compensation.

215. Writing for the Court, Chief Justice Rehnquist noted that Duquesne had "a state statutory duty to serve the public" and that its "assets are employed in the public interest," but that the company was "owned and operated by private investors."[180] Those characteristics set the regulated firm apart from others: "This partly public, partly private status of utility property creates its own set of questions under the Takings Clause of the Fifth Amendment."[181] Whether the allowed rates of a public utility violate the Takings Clause depends on whether they are "confiscatory."[182] That determination, the Court in 1898 admitted in *Smyth* v. *Ames*, is "always . . . an embarrassing question."[183] The answer to that question, however, does not depend on the use of any single methodology. The *Duquesne* Court reaffirmed the holding in *Hope* that it is the overall effect of rate regulation, not the details or methods, that matter:

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178. 488 U.S. at 302.

179. *Id.* at 303–04.

180. *Id.* at 307.

181. *Id.*

182. *Id.* at 307–08 (citing Covington & Lexington Turnpike Road Co. v. Sandford, 164 U.S. 578, 597 (1896); Federal Power Commission v. Natural Gas Pipeline Co., 315 U.S. 575, 585 (1942); Federal Power Commission v. Texaco Inc., 417 U.S. 380, 391–92 (1974).

183. *Id.* at 308 (quoting 169 U.S. 466, 546 (1898)).

> [I]t is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unreasonable, judicial inquiry . . . is at an end. The fact that the method employed to reach that result may contain infirmities is not then important.[184]

The question in *Duquesne* then was whether the rate of return that was achieved was constitutionally sufficient. The Court considered the unrecovered sunk costs as part of the investment on which to measure the overall rate of return.

2. Distinguishing Stranded Costs from the Unrecovered Prudently Incurred Investment in *Duquesne* That Did Not Constitute a Taking

216. Five facts convinced the Court that no taking of Duquesne's property had occurred. Those facts look very different in the case of breach of the regulatory contract. First, Duquesne did not claim "that the total effect of the rate order arrived at . . . is unjust or unreasonable," and, to the contrary, the Court found that "the overall effect is well within the bounds of *Hope*, even with total exclusion" of the prudently incurred costs for the nuclear plants.[185] "The Constitution protects the utility from the net effect of the rate order on its property. Inconsistencies in one aspect of the methodology have no constitutional effect on the utility's property if they are compensated by countervailing factors in some other aspect."[186] In contrast, the total exclusion of stranded costs could bankrupt certain utilities.

217. Second, Duquesne's "$35 million investment in the canceled plants comprises roughly 1.9% of its total base."[187] Although the Court here did not cite Justice Holmes's remark in *Pennsylvania Coal* about the transactions costs of compensating trivial takings of private property,[188] that consideration may have been present. In contrast, the amount of stranded costs at stake for an incumbent LEC may exceed the $35 million in *Duquesne* by orders of magnitude.

218. Third, the denial of cost recovery caused by the opportunistic behavior of the

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184. *Hope*, 320 U.S. at 602, *quoted in Duquesne*, 488 U.S. at 310
185. *Id.* at 311-12.
186. *Id.* at 314.
187. *Id.* at 312.
188. 260 U.S. at 413.

Pennsylvania legislature did not threaten Duquesne's survival:

> No argument has been made that these slightly reduced rates jeopardize the financial integrity of [Duquesne], either by leaving [it] insufficient operating capital or by impeding [its] ability to raise future capital. Nor has it been demonstrated that these rates are inadequate to compensate current equity holders for the risk associated with their investments under a modified prudent investment scheme.[189]

Again, breach of the regulatory contract unquestionably *does* jeopardize the financial integrity of incumbent local exchange carriers.

219. A fourth and related fact upon which the Court relied was that the opportunism exercised by the Pennsylvania legislature was not the most extreme version available to it, given the extent to which a public utility's income depended on the consistency of the rate methodology that its regulator employed:

> The risks a utility faces are in large part defined by the rate methodology because utilities are virtually always public monopolies dealing in an essential service, and so relatively immune to the usual market risks. Consequently, a State's decision to arbitrarily switch back and forth between methodologies in a way which required investors to bear the risk of bad investments at some times while denying them the benefit of good investments at others would raise serious constitutional questions. But the instant case does not present this question.[190]

Justice Scalia, joined by Justices O'Connor and White, concurred but warned, more forcefully than did Chief Justice Rehnquist's opinion for the majority, that the holding in *Duquesne* would not answer the question of whether just compensation would be due in future takings cases where the nature and magnitude of the utility's prudent investment differed substantially from Duquesne's:

> [W]hile "prudent investment" (by which I mean capital reasonably expended to meet the utility's legal obligation to assure adequate service) need not be taken into account as such in ratemaking formulas, it may need to be taken into account in assessing the constitutionality of the particular consequences produced by those formulas. We cannot determine whether the payments a utility has been allowed to collect constitute a fair return on investment, and thus whether the government's action is confiscatory, unless we agree upon what the relevant "investment" is. *For that purpose, all prudently incurred investment may well have to be counted.* As the Court's opinion describes, that question is not presented in the present suit, which challenges techniques rather than consequences.[191]

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189. 488 U.S. at 312.

190. *Id.* at 315.

191. *Id.* at 317 (Scalia, J., concurring) (emphasis added).

Breach of the regulatory contract *does* present the serious constitutional question that *Duquesne* did not, for it threatens to exploit the utility's irreversible investment to a far greater extent than does the opportunistic disallowance of costs through prudency reviews or other retrospective mechanisms.

220. Fifth, the Court understood that "utilities are virtually always public monopolies . . . relatively immune to the usual market risks."[192] New policies mandating network unbundling, however, would overturn that understanding, for the goal of such policies is to deny current providers of local telephony service all protection from the "usual market risks" of competition.

221. In short, although *Duquesne* forced utility investors to bear the losses from unrecovered but prudently incurred investments in nonsalvageable assets, the Court's reasoning indicates that the problem of stranded costs arising from breach of the regulatory contract would present a case distinguishable from *Duquesne* in all five respects.

222. An important implication of *Duquesne* is that utility investors must be compensated in one way or another for prudently incurred sunk costs. One possible method is to include the costs in the investment rate base. Another possible method is to increase the future allowed rate of return to be sufficiently above the cost of capital that the effect is as if the cost of capital had been allowed on all investments, including sunk cost losses. Another approach is to have increased the allowed rate of return at the time of investment in order to anticipate the possibility that stranding of investment may occur. What is *not* permitted is switching "back and forth between methodologies in a way which required investors to bear the risk of bad investments at some times while denying them the benefit of good investments at others."[193] The Court indicated that sunk costs should be paid by the ratepayers either by explicitly including the investments in the rate base (or by allowing an on-going rate of return sufficiently high that the economic effect is equivalent to including costs in the rate base) or on an ex ante basis where the allowed rate of return has been increased to compensate for the expected cost of

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192. *Id.* at 315.
193. *Id.*

stranding.[194] Otherwise, ratepayers must pay the costs of sunk costs when they occur, since investors were not compensated beforehand.

223. Property protections influence the incentives that utilities and ratepayers have to achieve the economically efficient result. If ratepayers bear prudently incurred sunk costs, they will lobby for abandonment of investments only when the economic value of alternative uses for the asset exceeds the value of the asset's continued use by the utility. That is precisely the efficient result. In contrast, investor-borne prudently incurred sunk costs result in inefficiency because the regulatory commission will be tempted to free ride by confiscating the property of the regulated utility.[195] That danger is particularly acute in the "endgame" that occurs in the transition from regulation to a competitive market.

D. Just Compensation for Takings

224. When is compensation for a taking "just"? Economic analysis provides a simple answer: *Compensation for involuntary exchange is just when it is equivalent to the compensation that could be derived from voluntary exchange.* Another way of stating the proposition is that the property owner is treated justly when he is made to be indifferent between voluntarily selling his asset and submitting to the state's power of eminent domain to condemn his asset for public use.[196]

225. That economic reasoning corresponds to the general principle in American constitutional law.[197] The Supreme Court has also repeatedly stated: "The owner is to be put in the same position monetarily as he would have occupied if his property had not been taken."[198] The same principle is

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194. *See* A. LAWRENCE KOLBE, WILLIAM B. TYE & STEWART C. MYERS, REGULATORY RISK: ECONOMIC PRINCIPLES AND APPLICATIONS TO NATURAL GAS PIPELINES AND OTHER INDUSTRIES (Kluwer Academic Publishers 1993); A. Lawrence Kolbe & William B. Tye, *The* Duquesne *Opinion: How Much* "Hope" *Is There for Investors in Regulated Firms?*, 8 YALE J. ON REG. 113, 123-27 (1991) [hereinafter *The* Duquesne *Opinion*]; Stephen F. Williams, *Fixing the Rate of Return After* Duquesne, 8 YALE J. ON REG. 159 (1991).

195. *See* Michael J. Doane & Michael Williams, *Competitive Entry into Regulated Monopoly Service and the Resulting Problem of Stranded Costs*, 3 HUME PAPERS ON PUB. POL'Y, No. 3, at 32 (1995).

196. *See* RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 182 (Harvard University Press 1985) ("In principle, the ideal solution is to leave the individual owner in a position of indifference between the taking by the government and retention of the property.").

197. *E.g.*, Olson v. United States, 292 U.S. 246, 255 (1934).

198. United States v. Reynolds, 397 U.S. 14, 16 (1970); *accord*, United States v. New River Collieries Co., 262 U.S. 341, 343 (1922); Seaboard Air Lines R. Co. v. United States, 261 U.S. 299, 304 (1922).

found in English common law for determining fair compensation for a taking: "The purpose of compensation is that it gives to the owner compelled to sell the right to be put as far as money can do it, in the same position as if his land had not been taken from him."[199] Indeed, English common law explicitly recognizes that compensation should be based on what the owner of the property could have received for it in voluntary exchange: "As the object is to find the money equivalent for the loss or, in other words, the pecuniary value to the owner contained in the asset, it cannot be less than the money value into which he might have converted his property had the law not deprived him of it."[200] Similarly, in a takings case decided in 1897 the Illinois Supreme Court defined market value to be "what the owner, if desirous of selling, would sell the property for; and what reasonable persons, desirous of purchasing, would have paid for it."[201]

226. Another way of phrasing the question is to ask what would be the full cost to the property owner of parting with the asset. The critical insight to answering that question comes from Armen Alchian's definition that "the cost of an event is the highest-valued opportunity necessarily forsaken."[202] The property owner, therefore, would demand the asset's opportunity cost. Again, English common law contains a corresponding expression of that economic reasoning. The property taken is to be valued not merely by reference to the use to which it is being put at the time, but the owner is also entitled to compensation for the potentialities or possibilities of development—that is, the property's opportunity

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199. English jurists have emphasized that the purpose of compensation is to "give[] to the owner compelled to sell . . . the right to be put, so far as money can do it, in the same position as if his land had not been taken from him." Horn *v.* Sunderland Corp., 1 All E.R. 480, 491 (C.A. 1941) (Scott, J.); *accord*, Maidstone Borough Council *v.* Secretary of State for the Env't, 3 P.L.R. 66 (C.A. 1995); *see also* Nelungaloo Pty. Ltd. *v.* *Commonwealth*, 75 C.L.R. 495, 571 (Austl. High Court 1948) ("[T]he purpose of compensation . . . . is to place in the hands of the owner expropriated the full money equivalent of the thing of which he has been deprived.").

200. *Id.* at 571-72 (Dixon, J.).

201. Ligare *v.* Chicago, Madison & N. R.R., 166 Ill. 249, 261-62, 46 N.E. 803, 808 (1897). *Accord*, Edgcomb Steel Co. *v.* State, 100 N.H. 480, 487 (1957). In his dissent in Munn *v.* Illinois, Justice Field made a similar observation about rate regulation: "The amount [of compensation] fixed will operate as a partial destruction of the value of the property, if it fall below the amount which the owner would obtain by contract . . . ." 94 U.S. (4 Otto) at 143 (Fields, J., dissenting).

202. Armen A. Alchian, *Cost*, *in* 3 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 404, 404 (David L. Sills ed., MacMillan Co. & Free Press 1968).

cost.[203]

227. The market value of the property is a sufficient measure of just compensation if it happens to take into account the opportunity cost of the taking. Justice Marshall observed that "[a]lthough the market-value standard is a useful and generally sufficient tool for ascertaining the compensation required to make the owner whole, the Court has acknowledged that such an award does not necessarily compensate for all values an owner may derive from his property."[204] The notion that the owner should be made whole means that the expected returns to the owner from the property should form the basis of compensation.

228. A deregulatory taking does not deprive the shareholders of the utility of the physical assets, including the plant and equipment and transmission system of the utility, nor does it deprive them of their ownership share in the regulated firm. Rather, regulators deprive shareholders of the expected returns associated with entry controls and pricing regulations that existed before the deregulation. Thus, it is not necessary to determine the purchase costs of the regulatory assets, nor their resale value, nor their replacement costs. The utility placed the assets in service in expectation of the earnings that would be received. The expected returns of the firm constitute *investment-backed expectations*.

229. Therefore, just compensation for a deregulatory taking should equal the change in the expected returns to the owners of the property. In the basic example of single-period returns, with compensation paid in the current period, just compensation is the difference between the expected net returns under regulation and the expected net returns under competition deriving from the property:

$$\textit{Just compensation} = \Delta.$$

If the property is expected to generate returns over multiple periods, those returns should be discounted at the appropriate rate, so that compensation equals the difference between the present discounted value

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203. Robinson Bros. (Brewers) Ltd. v. Houghton & Chester—Lee Street Assessment Committee, 2 K.B. 445 (1937), *aff'd*, A.C. 321 (1938) (House of Lords); *accord*, Emmons v. Power Utils. Co., 83 N.H. 181, 184 (1927).

204. United States v. 564.4 Acres of Land, 441 U.S. 506, 511 (1979).

of net earnings expected under regulation and those expected under competition. To make the investors whole, they should be compensated for the change in the value of the firm:

$$\textit{Just compensation} = \Delta^*.$$

Therefore, for the one period or the multiperiod case, just compensation for a deregulatory taking exactly equals damages for breach of contract.

230. Another way to determine the change in investment-backed expectations is to consider the change in the value of the firm to the shareholders as a consequence of deregulation. The value of the firm is the sum of each year's discounted cash flows net of investment requirements. Thus, in the absence of additional investment in the firm, the value of the firm is the present discounted value of expected earnings:

$$V = \sum_{t=0}^{T} \frac{(R_t^e - C_t^e)}{(1+i)^t}$$

The firm has a different value under regulation than it does under competition. Let V_1 and V_2 respectively denote the value of the firm calculated for net revenues under regulation and the value of the firm calculated using expected net revenues under competition. Then, it should be apparent that the change in the value of the firm is the difference between the two present discounted values of cash flows:

$$V_1 - V_2 = \Delta^*.$$

Thus, just compensation for a deregulatory taking from investors is equal to the change in the value of the firm.

VII. The Commission's "Market-Based Approach" Would Impose an Unconstitutional Condition on Access Reform

231. Property rights help to ensure that market exchange is voluntary. Even if property rights to goods were complete and exclusive, transferability is required for prices to emerge and to enable goods

to be allocated to the highest-value user. Property rights protect individuals from confiscation of property by either individuals, companies, or the government. The Supreme Court emphasized in *Dolan* v. *City of Tigard*, a land-use case, as it had in earlier takings cases, that "the right to exclude others [is] 'one of the most essential sticks in the bundle of rights that are commonly characterized as property.'"[205] The Court also saw a connection between takings jurisprudence and the problem of unconstitutional conditions: "Under the well-settled doctrine of 'unconstitutional conditions,' the government may not require a person to give up a constitutional right—here the right to receive just compensation when property is taken for a public use—in exchange for a discretionary benefit conferred by the government where the property sought has little or no relationship to the benefit."[206] Similarly, recognizing the potential for unconstitutional conditions in situations involving mandatory access, the Court in *Loretto* said that "a landlord's ability to rent his property may not be conditioned on his forfeiting the right to compensation for a physical occupation."[207] The same reasoning applies to an incumbent LEC selling wholesale services or unbundled network elements to entrants into the local market. The government, for example, could not "require a landlord to devote a substantial portion of his building to vending and washing machines, with all profits to be retained by the owners of these services and with no compensation for the deprivation of space."[208] Consistent with its solicitude for property rights when physically invaded, the Court has been equally absolutist on the question of unconstitutional conditions: "The right of a property owner to exclude a stranger's physical occupation of his land cannot be so easily manipulated."[209]

232. Those statements put a new face on the relationship between mandatory unbundling and the Commission's proposed "reform" of interstate access. The *Notice* in this proceeding confronts the

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205. 129 L. Ed. 2d 304, 316 (1994) (quoting Kaiser Aetna v. United States, 444 U.S. 164, 176 (1979)).

206. *Id.* at 316 (citing Perry v. Sindermann, 408 U.S. 593 (1972); Pickering v. Board of Ed. of Township High School Dist., 391 U.S. 563, 568 (1968)). *See generally* RICHARD A. EPSTEIN, BARGAINING WITH THE STATE (Princeton University Press 1993).

207. 458 U.S. at 438 n.17

208. *Id.*

209. *Id.*

incumbent LEC with a quid pro quo: To be granted by the FCC the continued opportunity to recover some portion of common costs of the local exchange network from revenues earned from the provision of interstate access, the incumbent LEC must agree to sell its unbundled network elements and wholesale services at the FCC's uncompensatory prices to entrants in the local exchange market. Those entrants are principally the IXCs themselves. Thus, the price for the incumbent LEC to preserve some level of contribution to the recovery of common costs from access charges is for the LEC to sacrifice its claim that the Commission's *First Report and Order* violates the Takings Clause by mandating the pricing of UNEs and resale at uncompensatory levels.

VIII. *MARKET STREET RAILWAY* AND THE DIMINUTION IN VALUE OF THE FRANCHISE OF THE INCUMBENT LEC

233. Entrants into local telephony markets frequently cite the Supreme Court's 1945 decision in *Market Street Railway Co.* v. *Railroad Commission of California*,[210] for the proposition that no taking of property occurs when deregulation cause a drop in the value of the incumbent LEC. That argument is incorrect because it misapprehends the logic of that important decision.

234. *Market Street Railway* involved a privately owned railway operating a street car and bus line in and around San Francisco. Increased competition from other forms of transportation, such as buses and automobiles—as well as direct, probably taxpayer-subsidized competition from a municipally owned railway—had eroded the railway's passenger base and financial condition. In 1937 the railway began petitioning the state railway commission for a fare increase from five to seven cents. The commission approved the seven-cent fare in 1939. Initially, the increased fare produced no increase in revenues; passenger traffic continued to decline, no doubt at least partly in response to the higher fare. Meanwhile the city railway continued to charge only five cents. Although demand subsequently increased as a result of conditions caused by World War II, the commission became concerned about the continued deterioration of service. It instituted an inquiry into both the reasonableness of the rates and the adequacy of

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210. 324 U.S. 548 (1945).

service. The commission concluded the inquiry by ordering an experimental decrease in the fare from seven to six cents, partly because it hoped to increase revenues by stimulating demand. The company obtained a delay in implementing the new fare pending judicial review, and eventually it sold its properties to the city's municipally owned railway.

235. The U.S. Supreme Court affirmed the California Supreme Court and ruled that the commission's order that the railway company reduce its base cash fare from seven to six cents did not deprive the Market Street Railway of its property without due process of law under the Fourteenth Amendment of the U.S. Constitution. Although the company advanced numerous procedural and substantive arguments, its central objection was the commission's decision, when calculating the new six-cent fare, to use a rate base of $7,950,000, the amount at which the company had offered to sell its properties to the city. The lower fare, the company argued, compelled the company to operate at a loss. By relying on the sales amount, the company contended that the commission improperly disregarded "reproduction cost, historical cost, prudent investment, or capitalization bases, on any of which under conventional accounting the six-cent fare would produce no return on its property and would force a substantial operating deficit upon the Company."[211]

236. Three factors distinguish *Market Street Railway* from the present cases of local exchange carriers attempting to recover their stranded costs. First, Market Street Railway's costs became stranded because of changing economic and technological forces, not because of decisions by the regulatory body or other changes in law and regulation. The Court repeatedly emphasized that the streetcar industry was growing obsolete for reasons beyond the control of either the company or regulators: "It has long been recognized that this form of transportation could be preserved only by the most complete cooperation between management and public and the most enlightened efforts to make the service attractive to patrons."[212] As early as 1919, the Court noted, the Secretary of Commerce and the Secretary of Labor

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211 *Id.* at 553-54.
212 *Id.* at 565.

had advised President Wilson that the urban street railway industry as a whole was "virtually bankrupt."[213] Because the railway owed its deterioration to industry-wide conditions and market forces rather than any acts or omissions by regulators, there could be no constitutional violation:

> The due process clause has been applied to prevent governmental destruction of existing economic values. It has not and cannot be applied to insure values or to restore values that have been lost by the operation of economic forces.[214]

Unlike the streetcar industry of the early twentieth century, today's incumbent LECs do not face steadily diminishing demand for telecommunications services and the looming obsolescence of their transmission and switching infrastructure. There is continued demand to use the infrastructure of the incumbent LEC.

237. Second, the expected obsolescence of the streetcar infrastructure drastically undermined the company's ability to argue that a higher rate of return was essential to attract future capital investment. As the Court explained, prior decisions involving economically viable utility companies are largely inapplicable to industries shortly to be relegated to the dustbin of history:

> It is idle to discuss holdings of cases or to distinguish quotations in decisions of this or other courts which have dealt with utilities whose economic situation would yield a permanent profit, denied or limited only by public regulation. While the Company does not assert that it would be economically practicable to obtain a return on its investment, it strongly contends that the order is confiscatory by the tests of *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603, 605, from which it claims to be entitled to a return "sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital" and to "enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed." Those considerations . . . concerned a company which had advantage of an economic position which promised to yield what was held to be an excessive return on its investment and on its securities. They obviously are inapplicable to a company whose financial integrity already is hopelessly undermined, which could not attract capital on any possible rate, and where investors recognize as lost a part of what they have put in.[215]

Incumbent LECs, in contrast, are likely after mandatory unbundling to need to raise capital on a routine and recurring basis.

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213. *Id.* at 565 n.8.
214. *Id.* at 567.
215. *Id.* at 566.